

Figure 1a

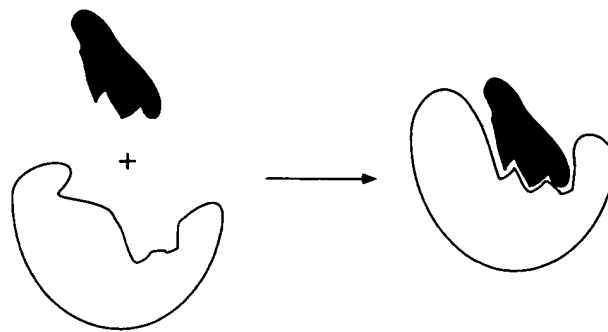


Figure 1b

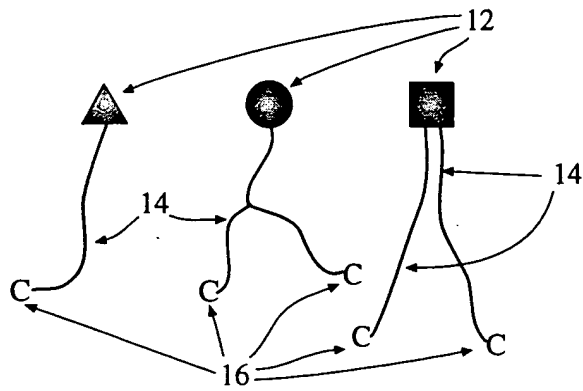


Figure 2(a)

4005637 403604

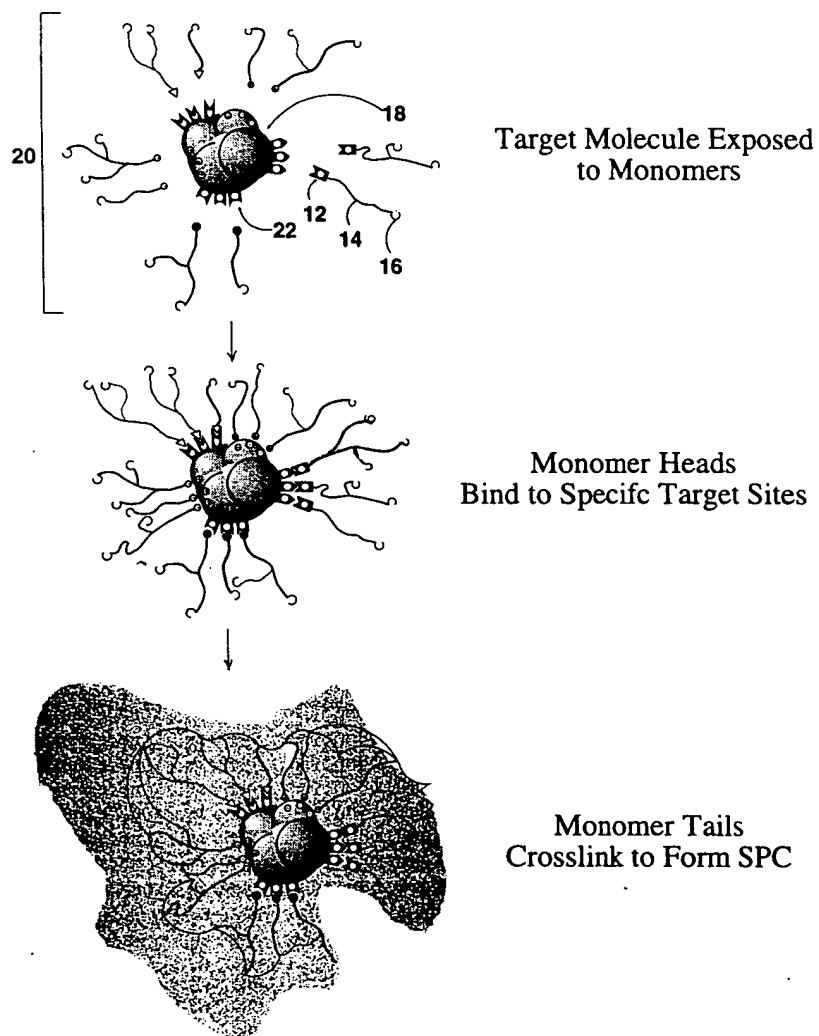
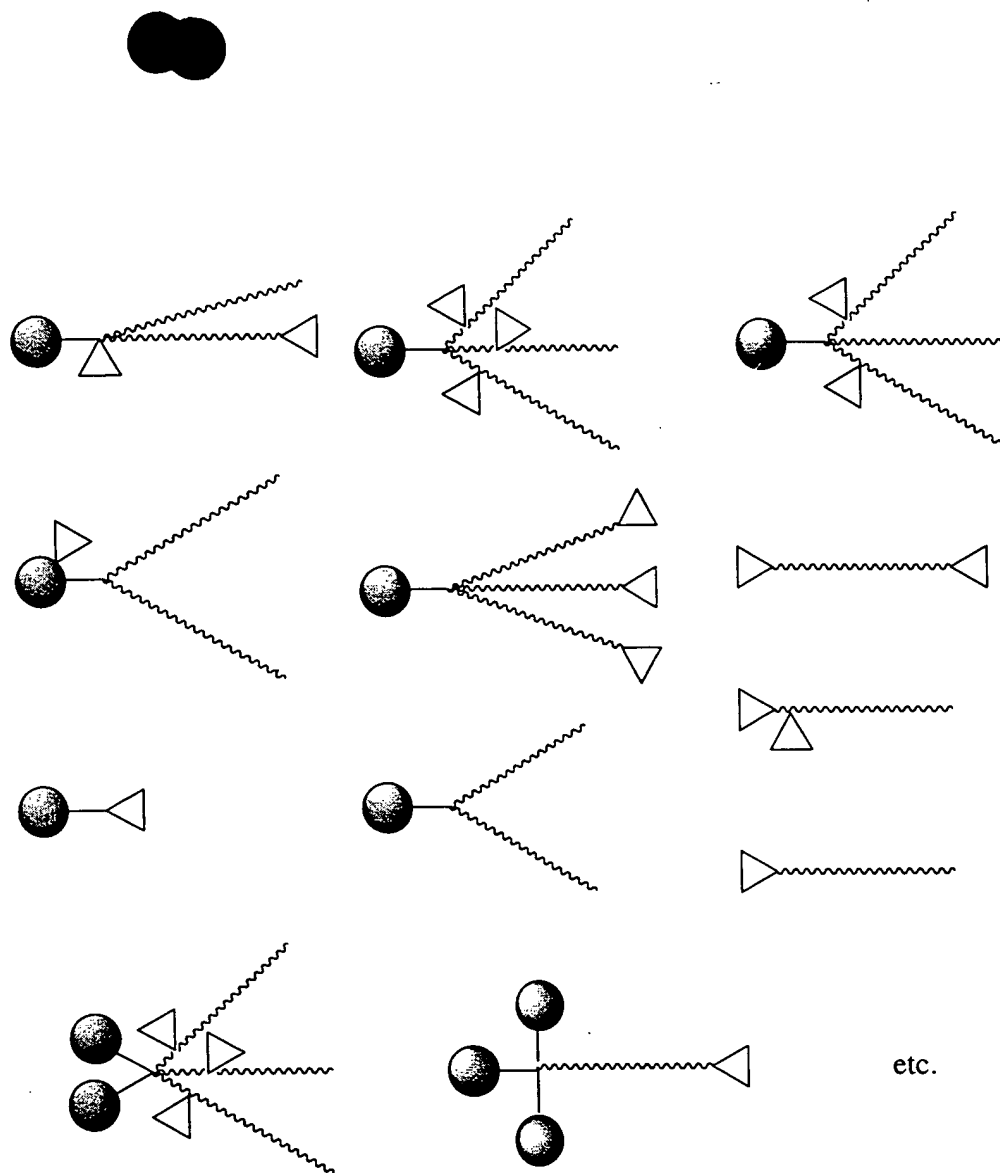


Figure 2b



Key to Shapes



Head



Crosslinking
moieties



Tail

Figure 2c

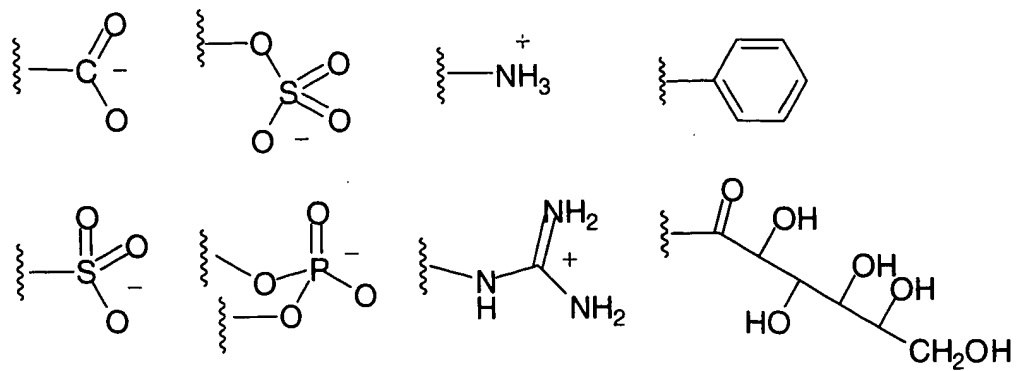


Figure 3

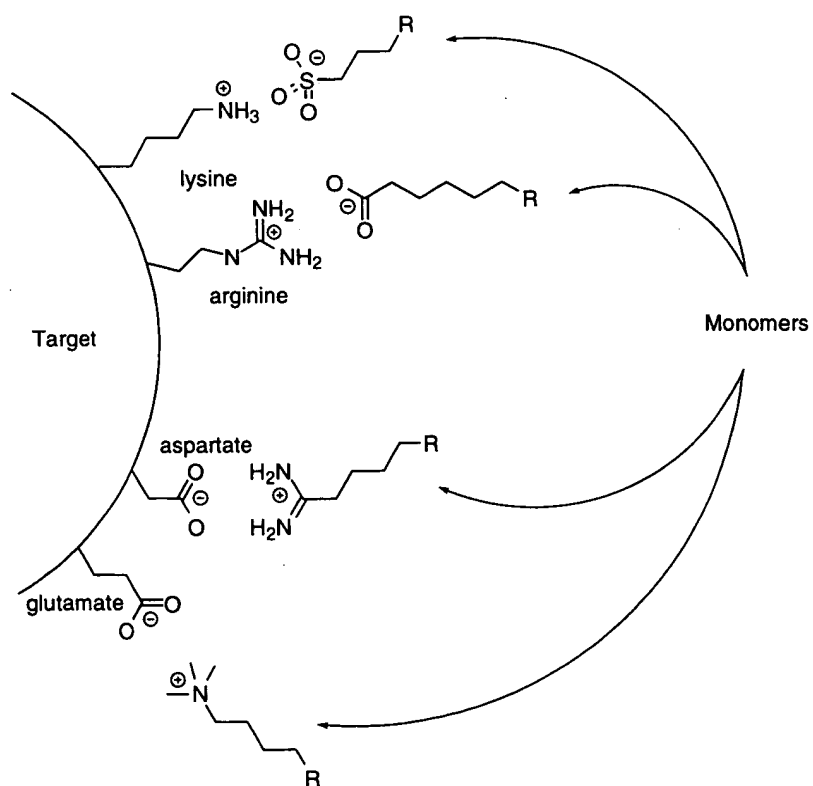


Figure 4

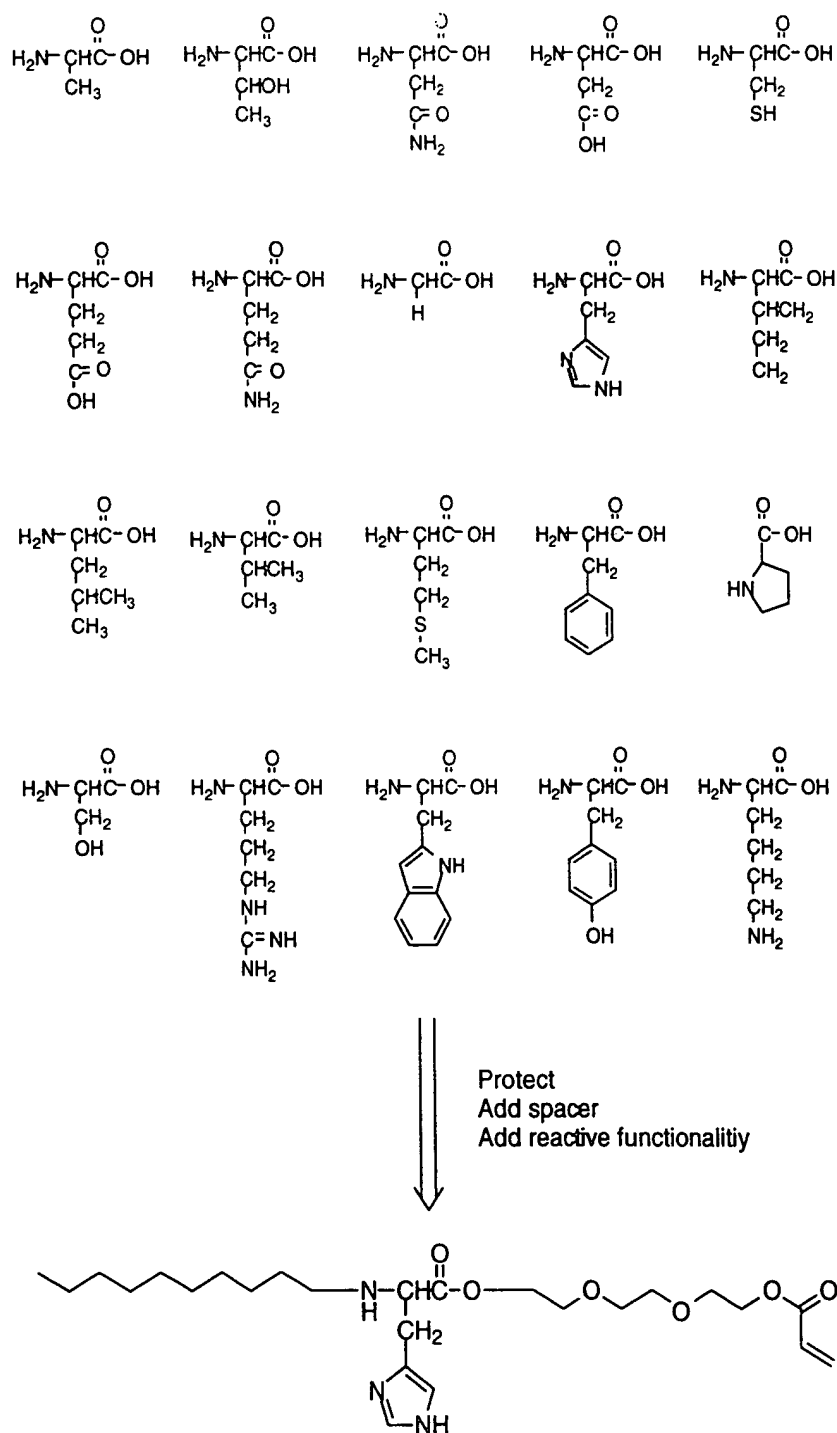
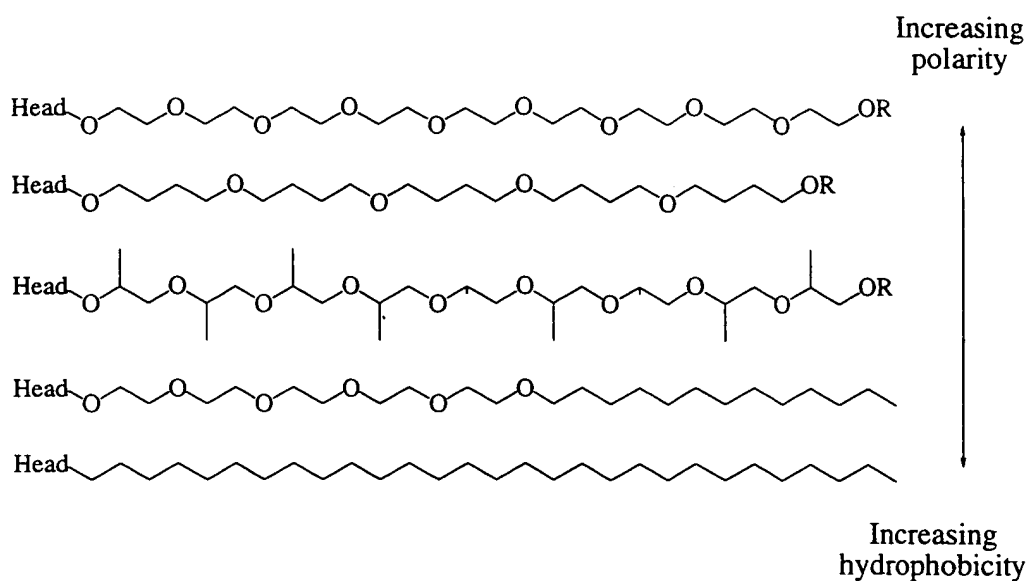
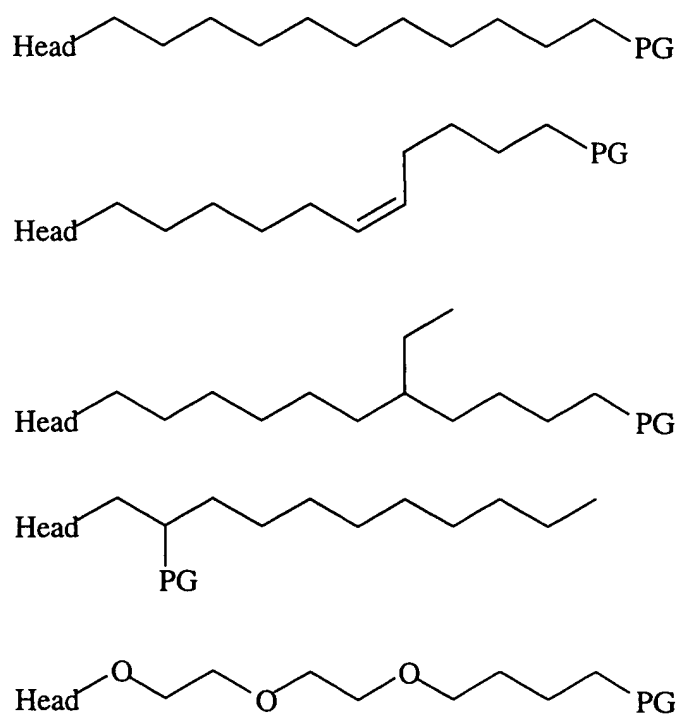


Figure 5



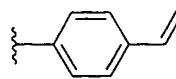
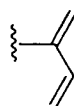
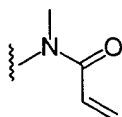
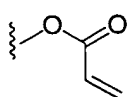
R = H or CH₃. The polymerizable group may be attached at any point along the tail structure

Figure 6



PG = Polymerizable Group

Figure 7



• Medium Polarity

• Low to No Polarity

Figure 8

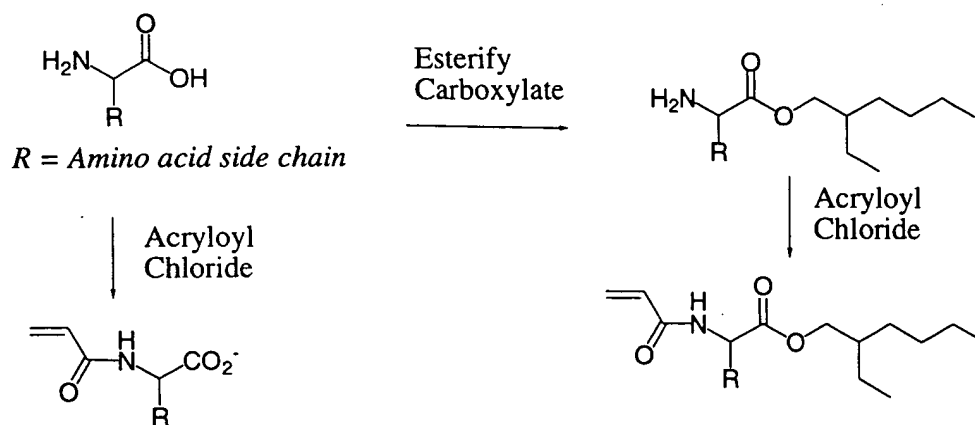
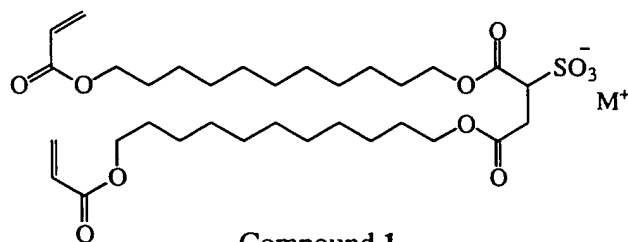
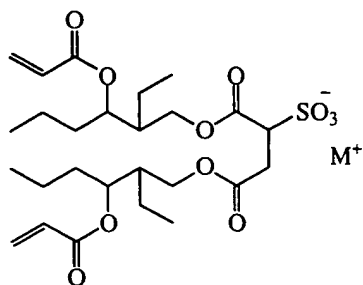


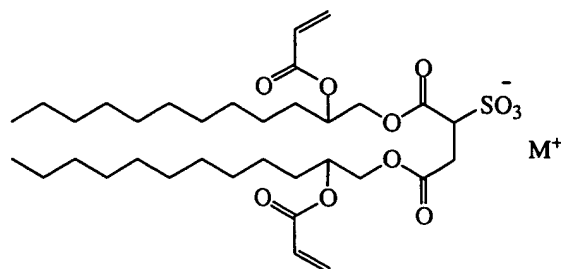
Figure 9



Compound 1

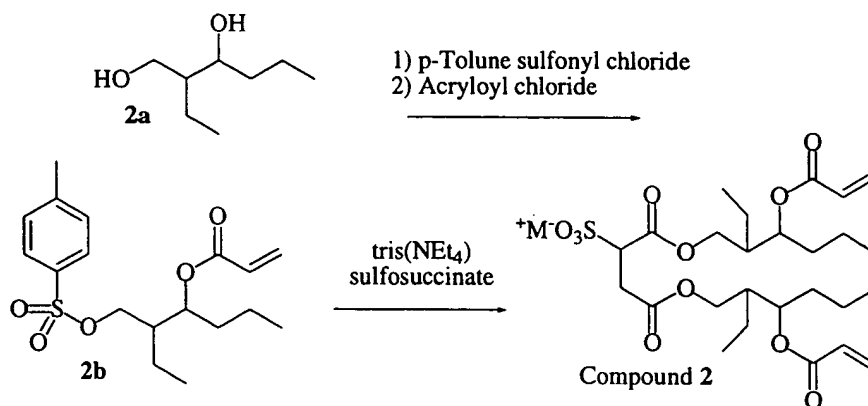
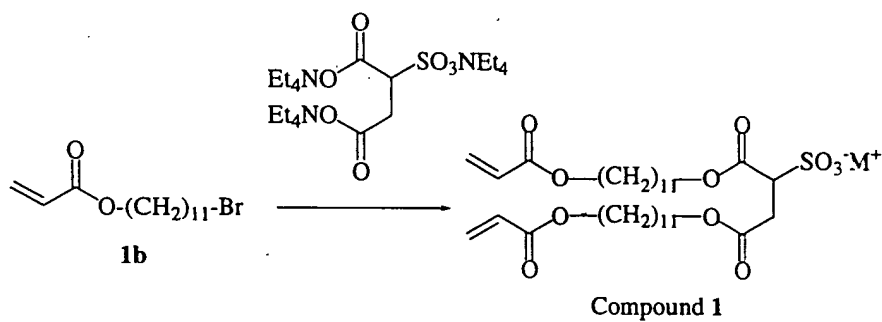
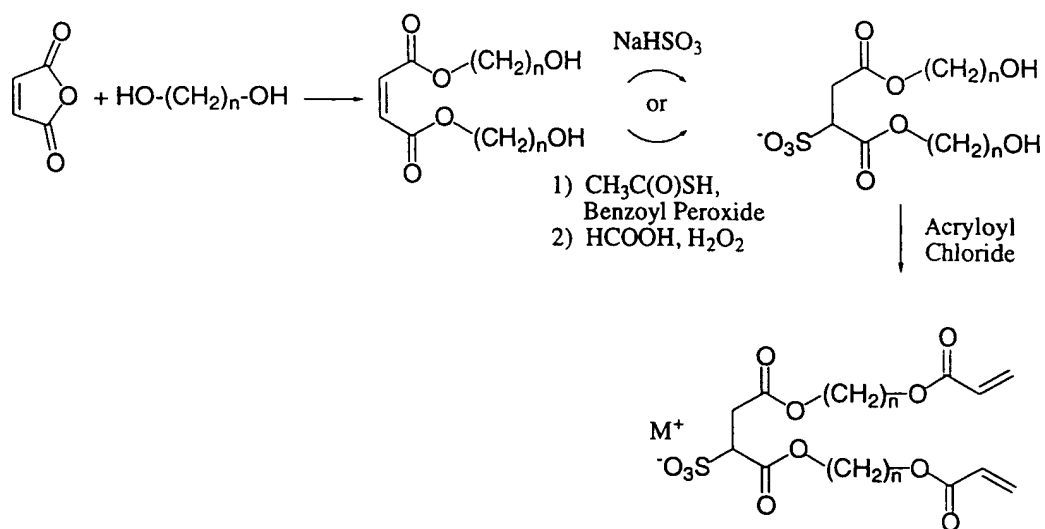


Compound 2



Compound 3

Figure 10



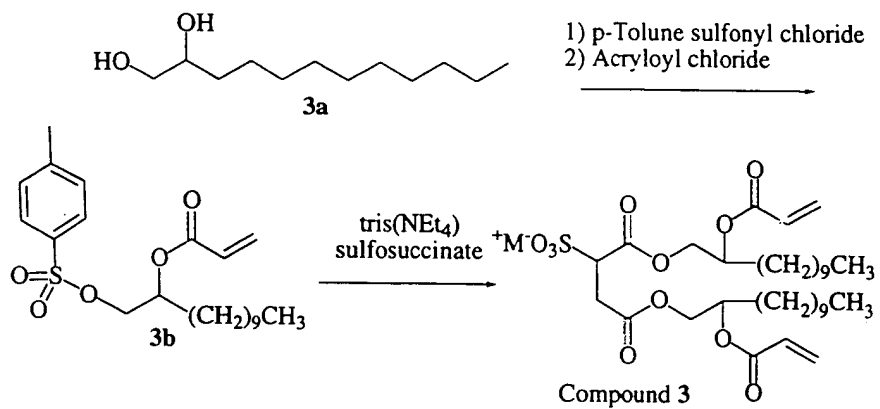


Figure 11d

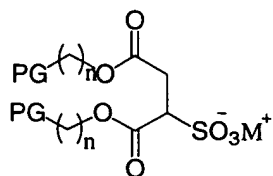


Figure 12

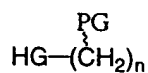


Figure 13

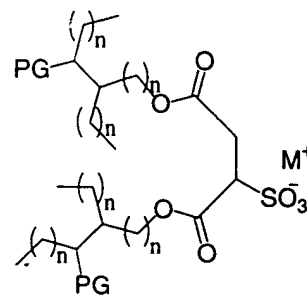


Figure 14

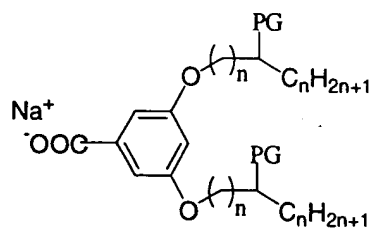


Figure 15

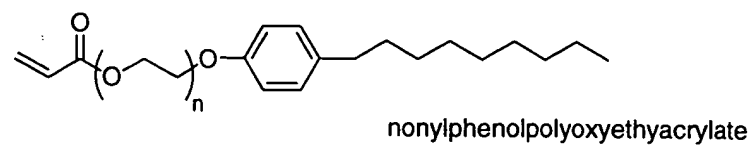
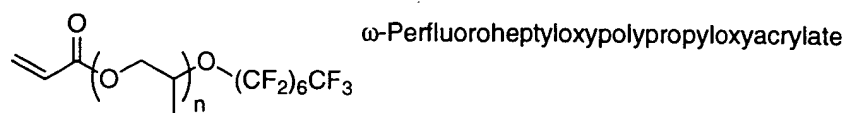
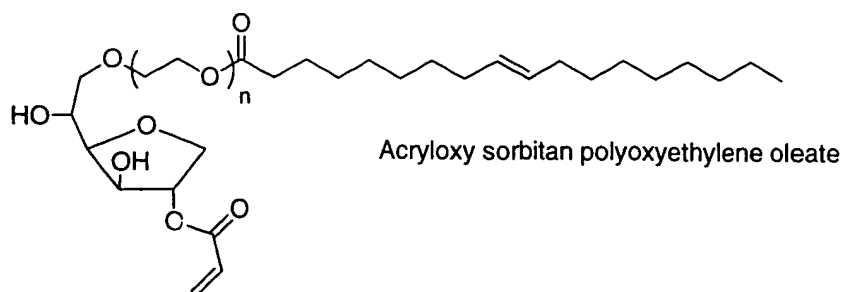
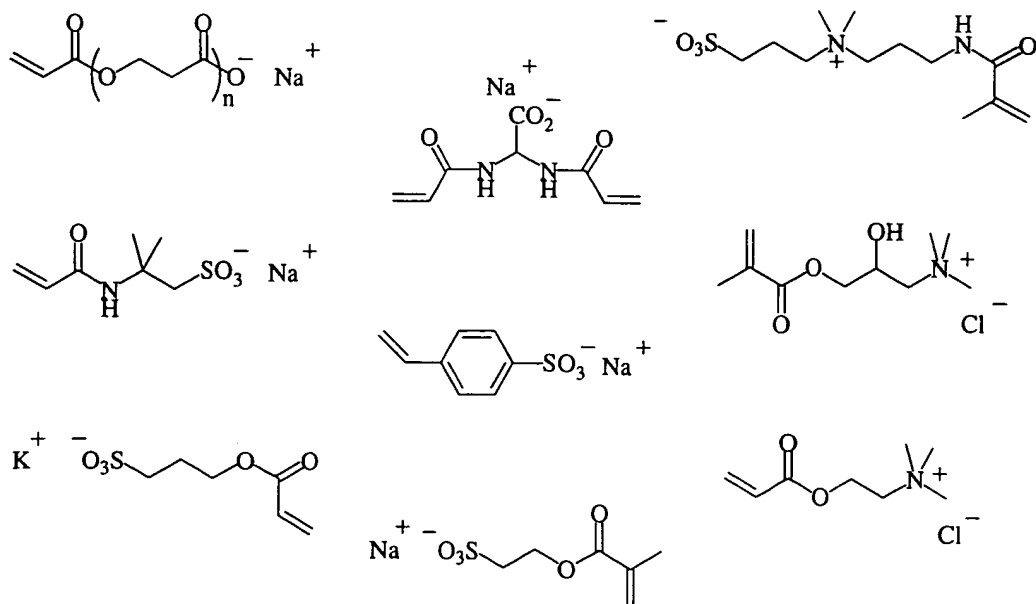
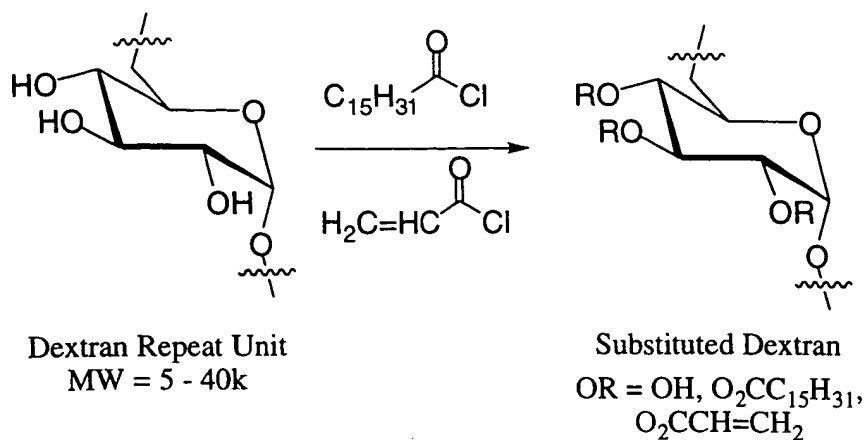
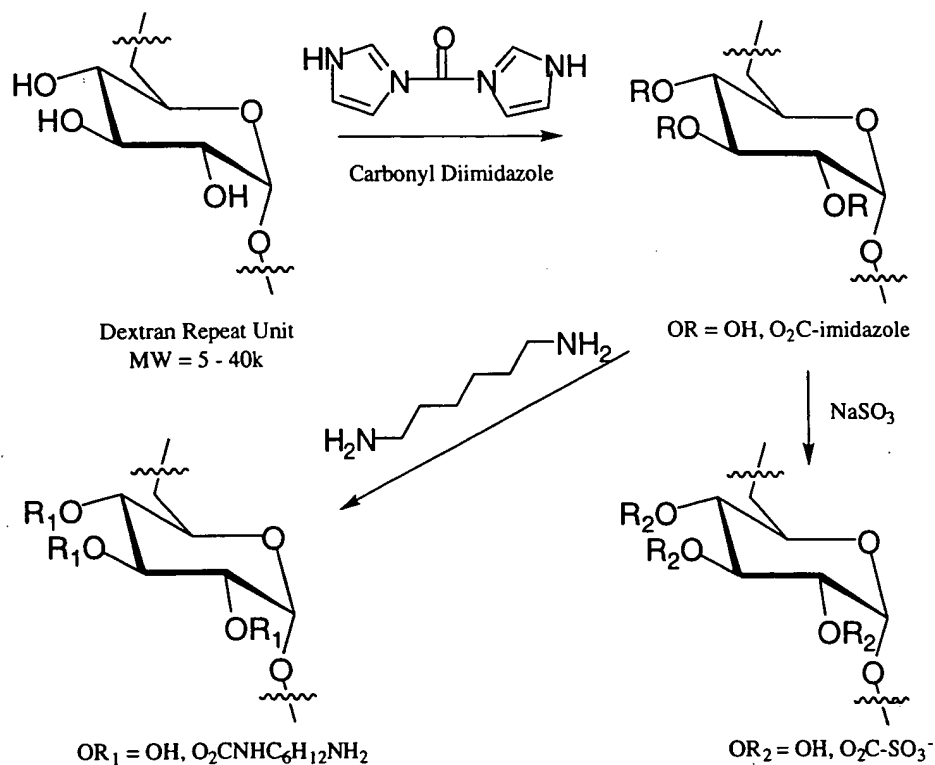


Figure 16



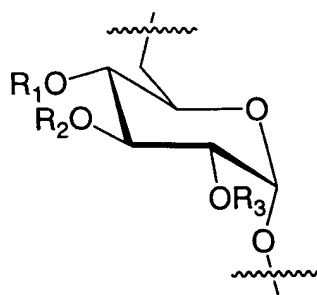


Carbohydrate based reactive surfactants



Addition of polar headgroups to polysaccharides

Figure 19c



Formula 6

Figure 19d

10055937 102674

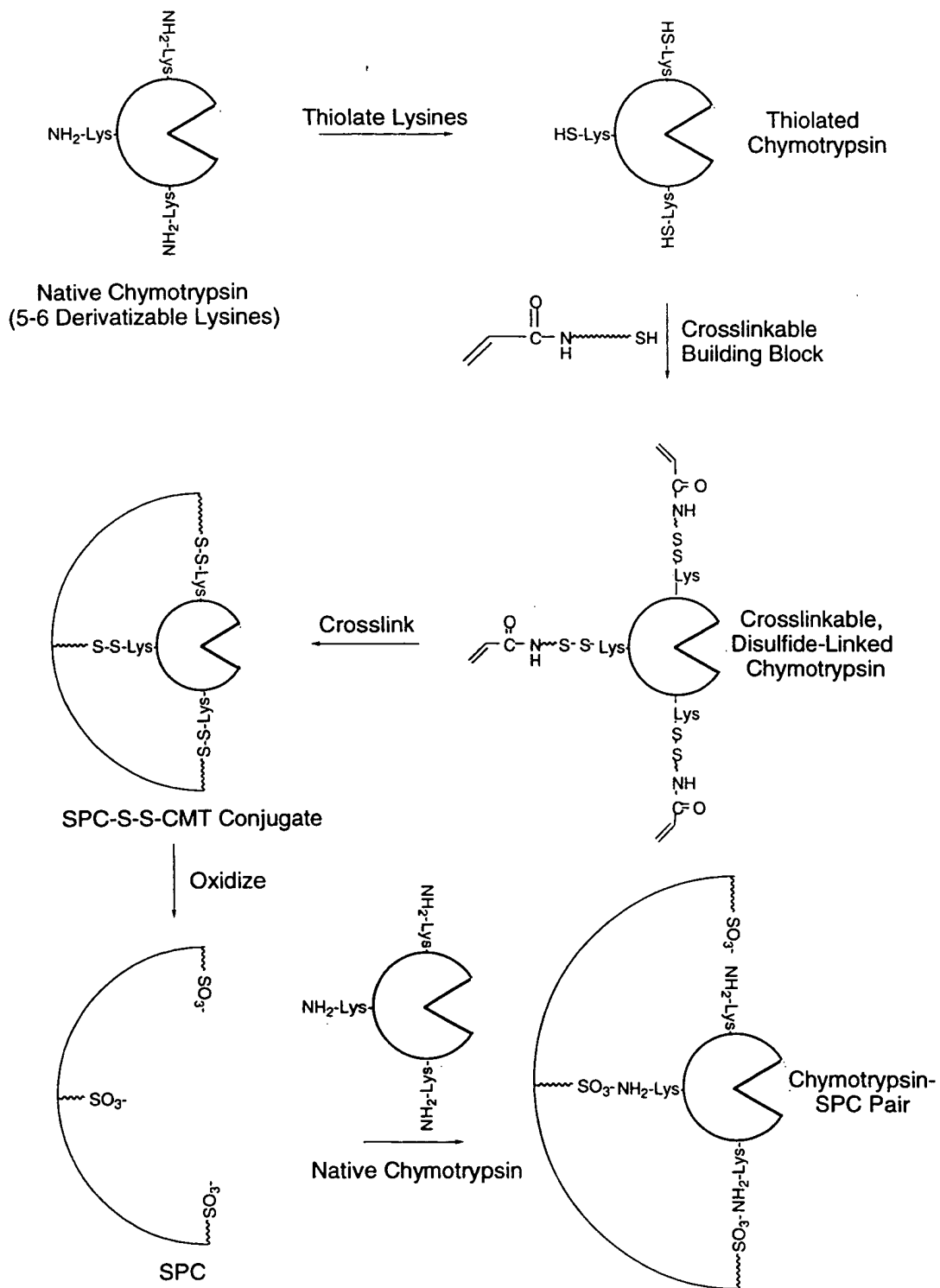


Figure 20a

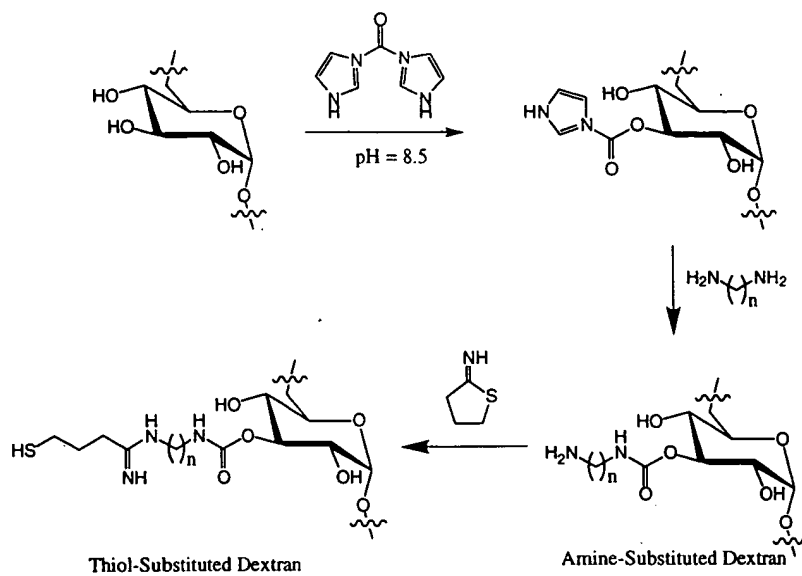
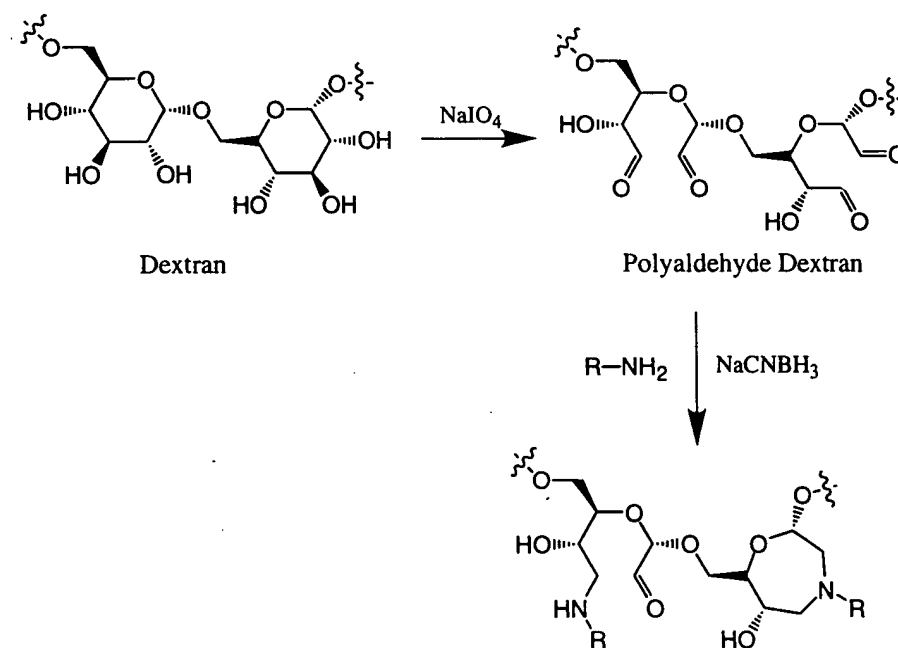


Figure 42



Secondary and Tertiary Amine Formation

Figure 43

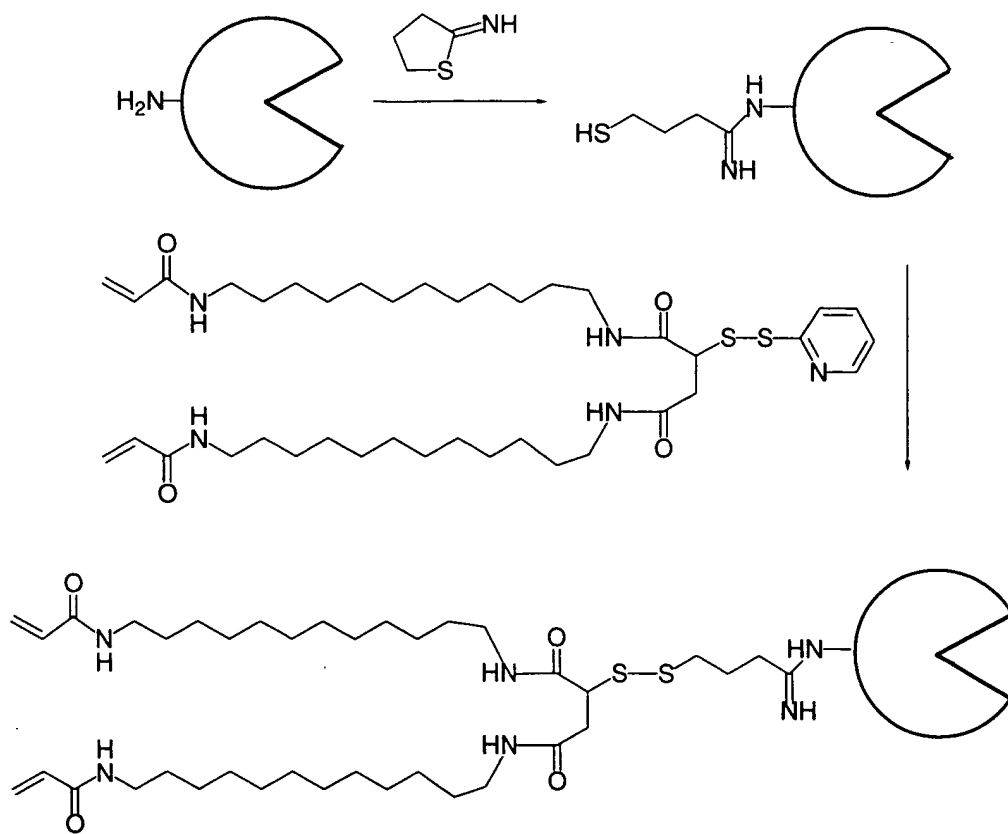


Figure 20c

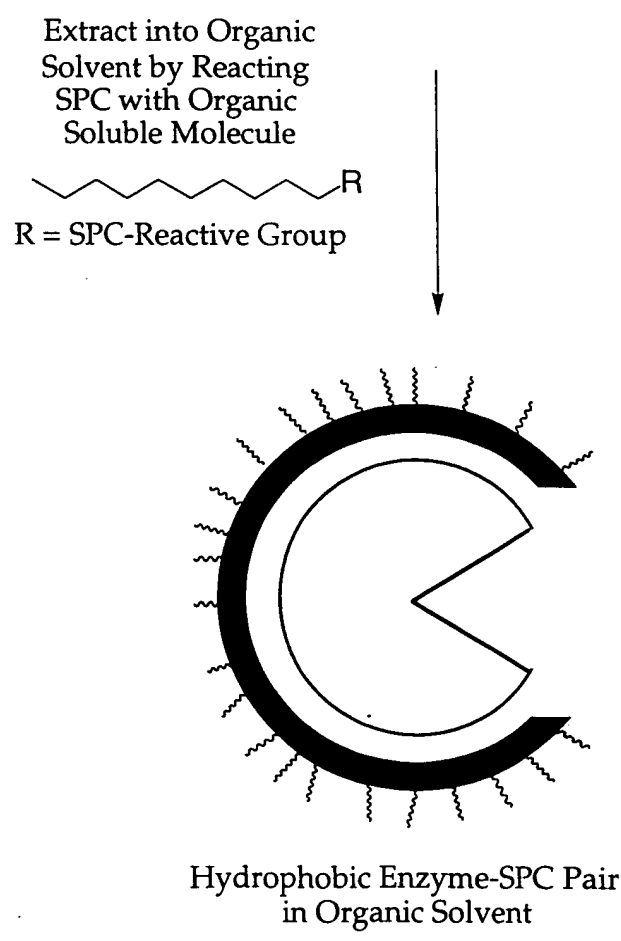
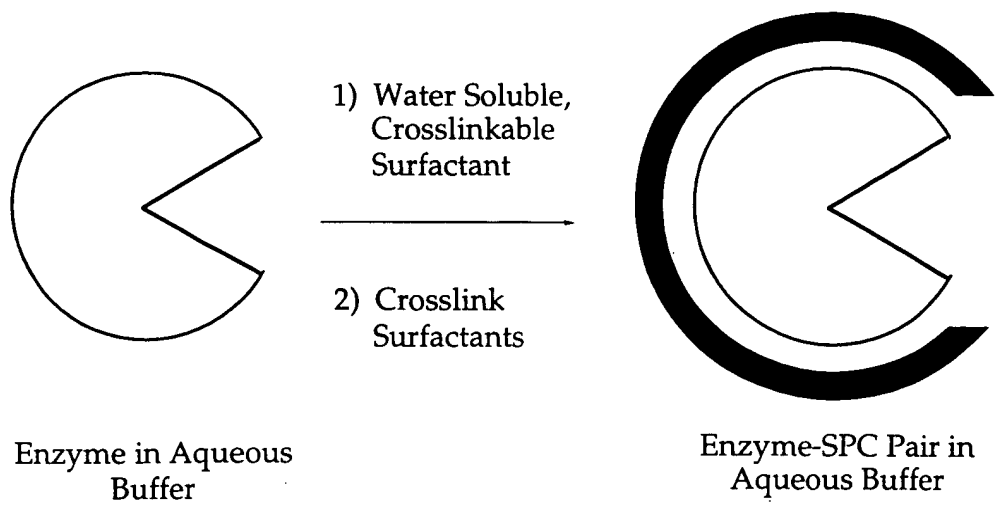


Figure 21

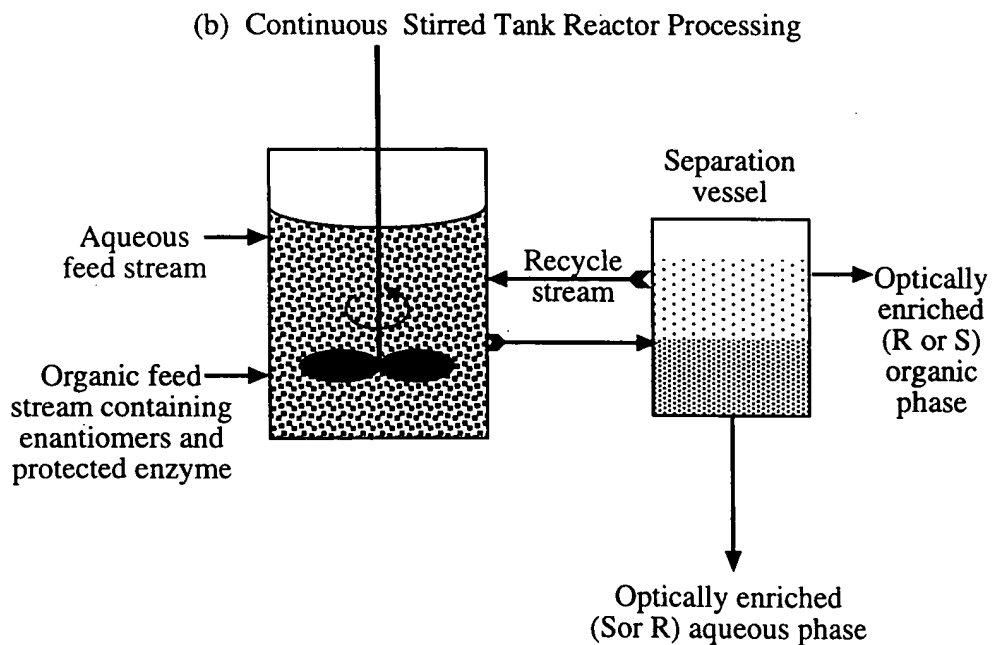
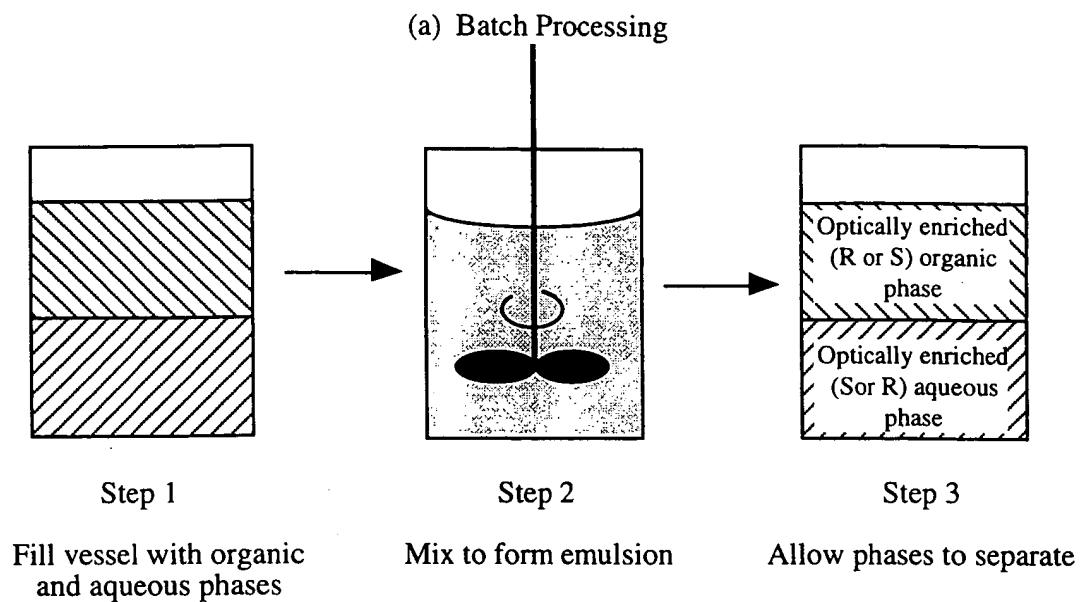


Figure 22

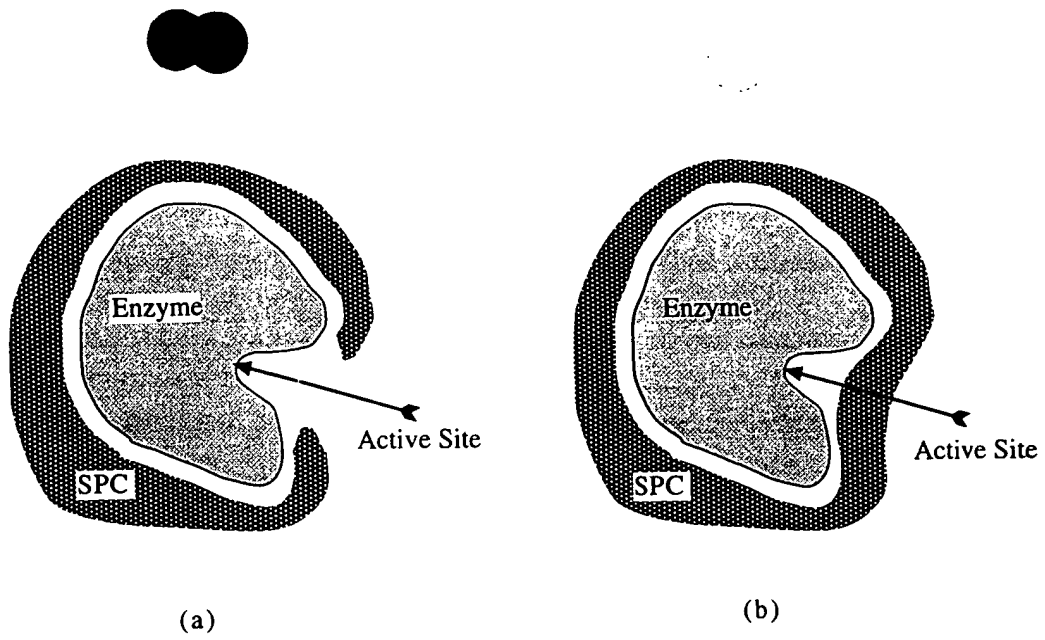


Figure 23

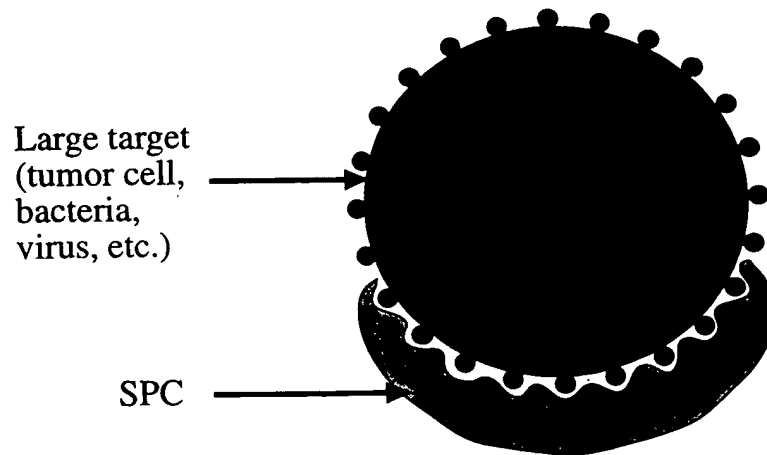


Figure 24

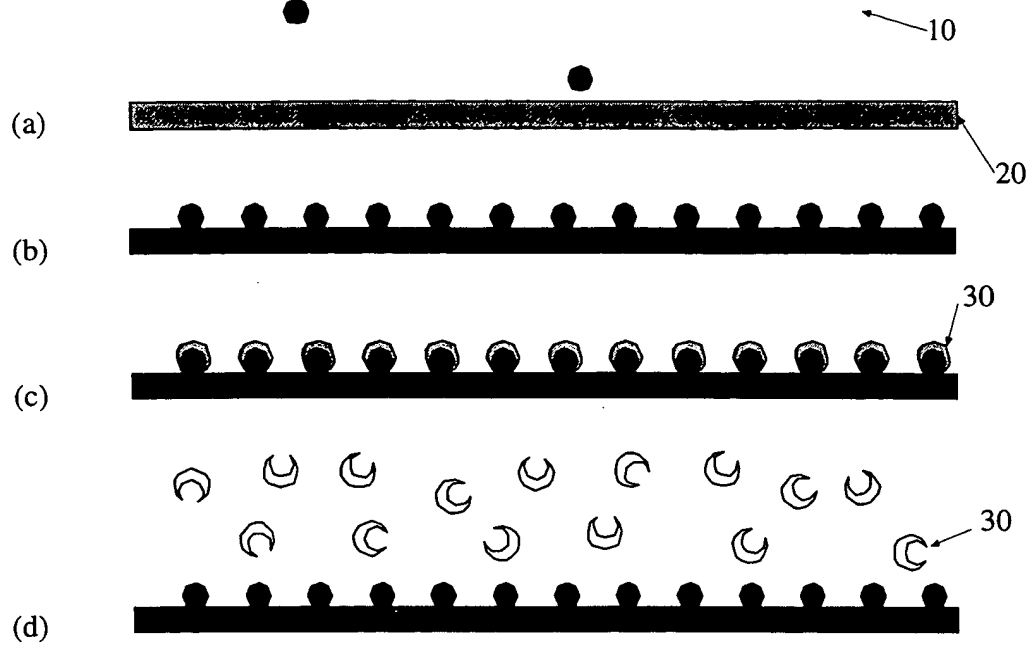


Figure 25

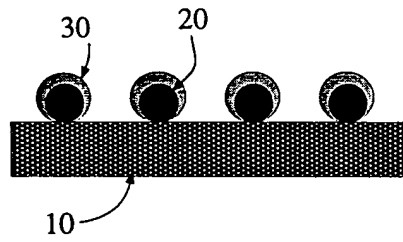


Figure 26

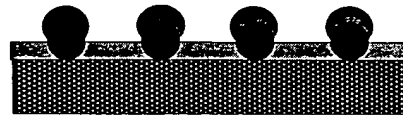


Figure 27


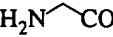
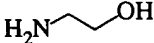
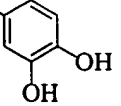
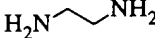
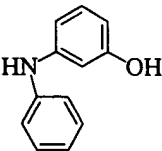
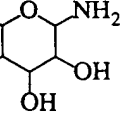
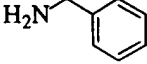
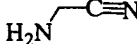
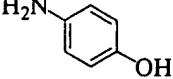

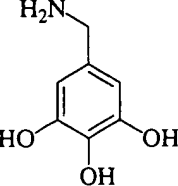
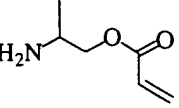
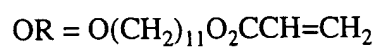
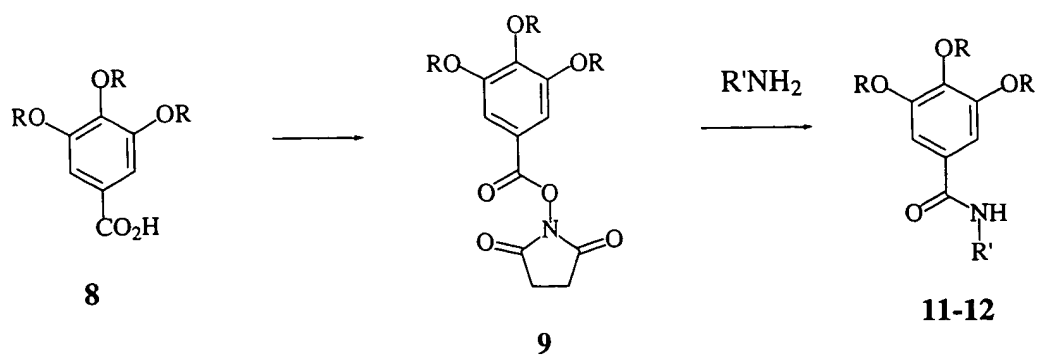
R'NH ₂		
		
		
		
		
		

Figure 31



Exemplary Compounds **11** and **12**

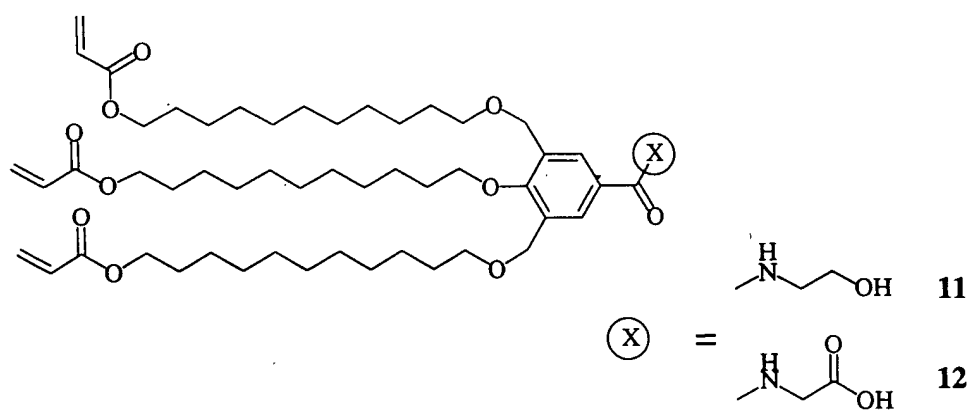
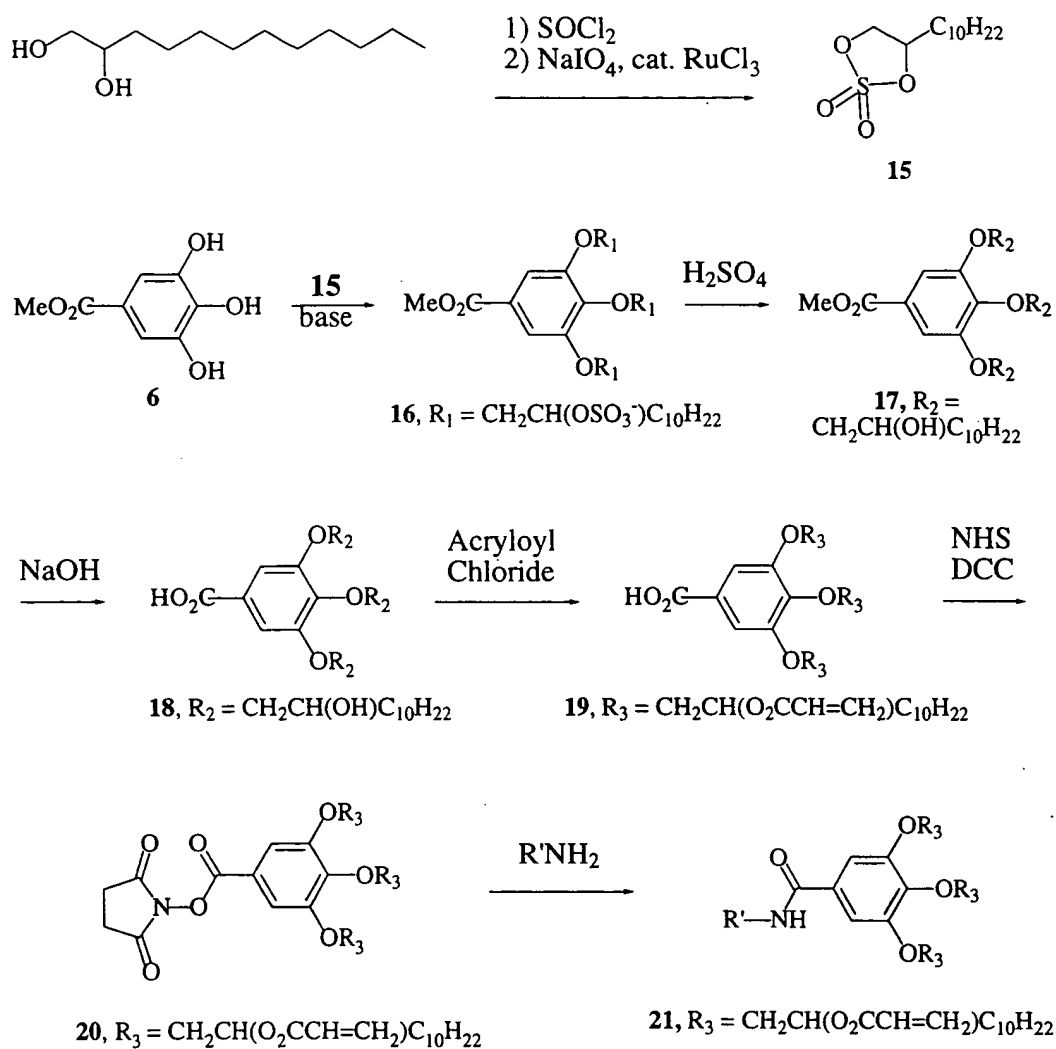
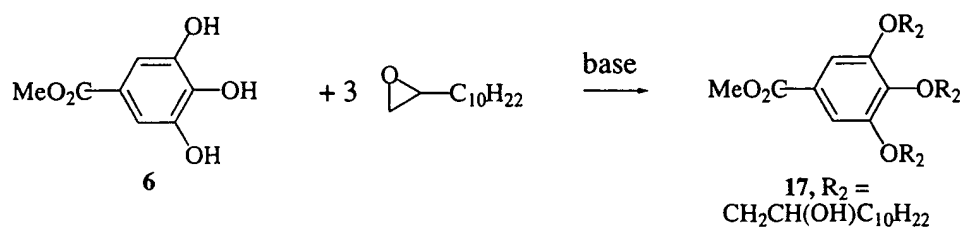


Figure 32



(a)



(b)

Figure 33

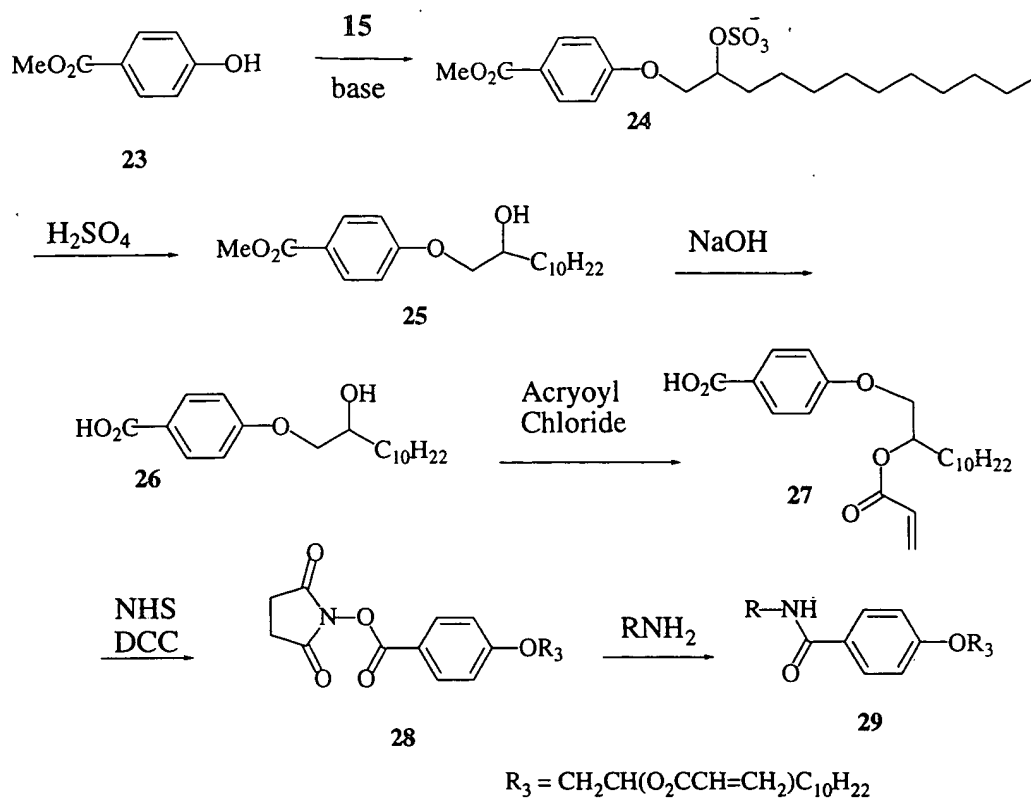


Figure 34

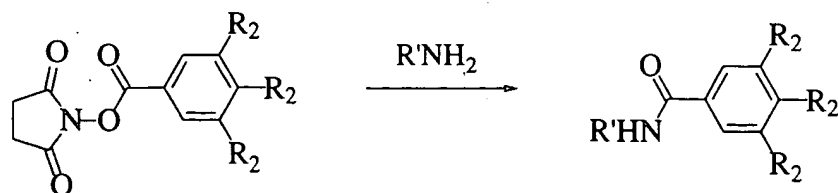
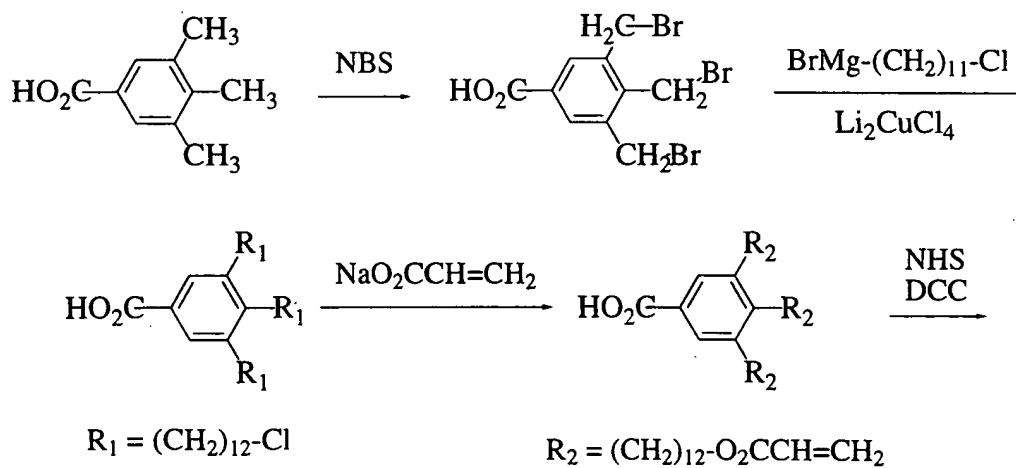


Figure 35

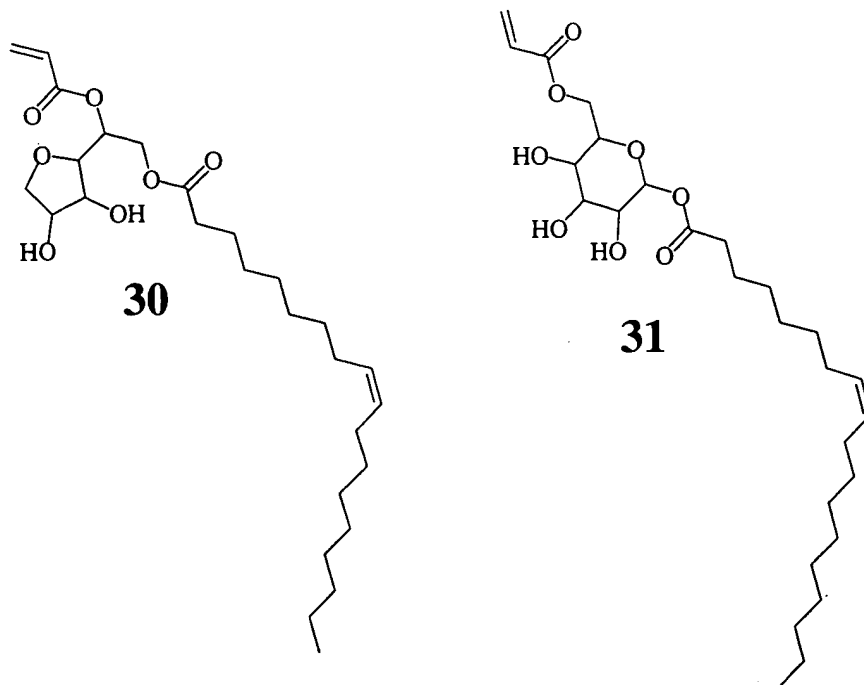


Figure 36

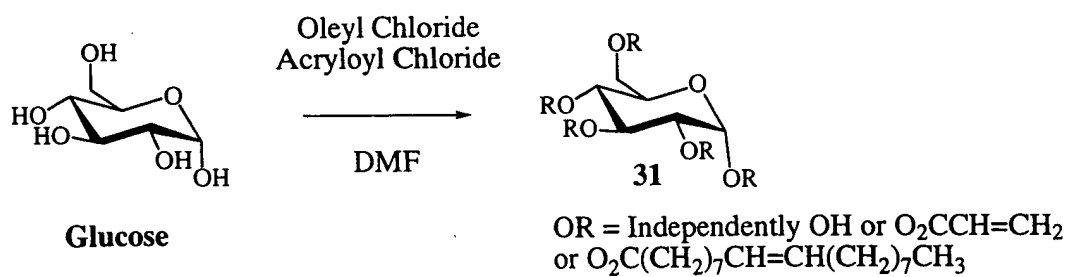


Figure 37

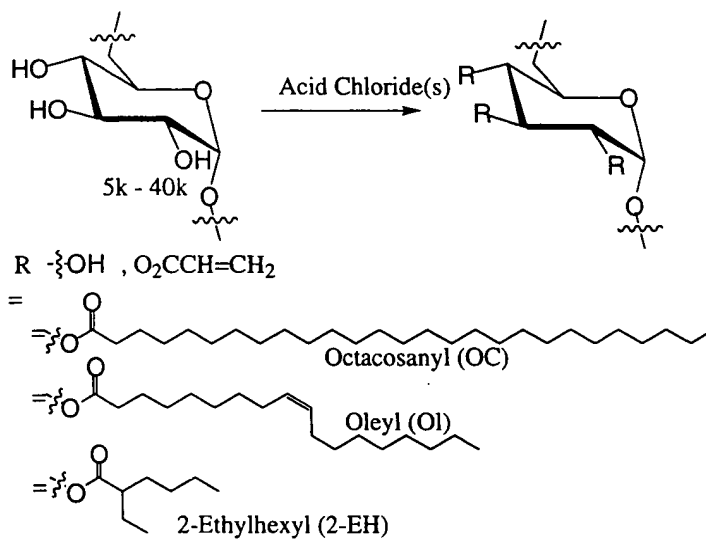


Figure 38

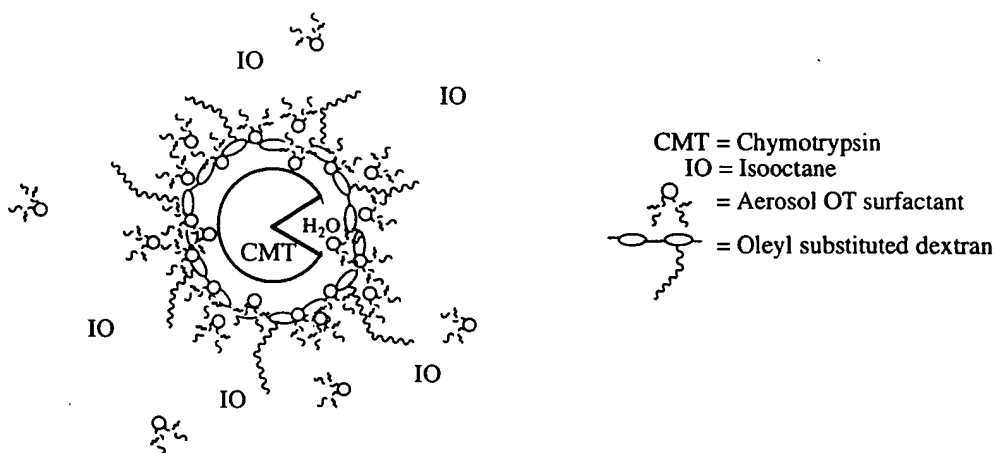
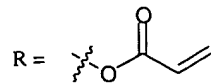
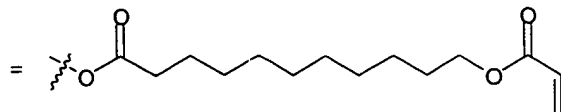


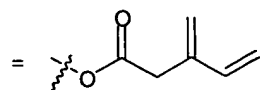
Figure 39



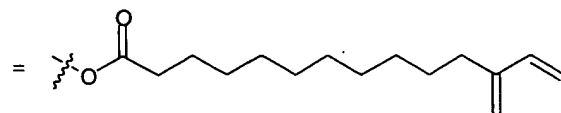
Acrylate Tail (Ac)



Acrylate Hydrophobic Tail (AcH)



Butadiene Tail (Bd)



Butadiene Hydrophobic Tail (BdH)

Figure 40